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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
SIM, YONG H	

ART UNIT	PAPER NUMBER
2629	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/773,227	FURUKAWA ET AL.	
	Examiner	Art Unit	
	MATT SIM	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 December 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-60* is/are pending in the application.

4a) Of the above claim(s) *1-41,47-55 and 57-60* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *42-46 and 56* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/ are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/09/2004,12/19/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 42 – 46 and 56 in the reply filed on 12/28/2008 is acknowledged.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. The term "fastest" in claim 45 is a relative term which renders the claim indefinite. The term "fastest" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

It is unclear what the degree of the term "fastest" in relationship to the attainment tone is. Since applicant states a degree of term that can not be defined, for the purpose of art rejection, the term "fastest" will be construed as being "within a frame."

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 42, 43, 45 and 56 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyata et al. (Hereinafter "Miyata" US 2002/0033789 A1).**

Re claim 56, Miyata teaches a liquid crystal device which includes a liquid crystal panel and a drive circuit (See Fig. 1), wherein:

the drive circuit stores as a Look-up Table an optimum level of a test signal consisting of either only an overshoot signal (Para 0090; "The tone data stored in the form of the look-up table in the LUT memory." Para 0097; "The response can be improved with correction since in this case the influence of capacitance change of the liquid crystal cell can be suppressed." See Fig. 6, the overshoot voltage is applied as a correction to obtain correction tone within one frame.) or both an overshoot signal and an undershoot signal in accordance with tone transition from an original tone to an attainment tone; and

the optimum level of the signal is obtained by an evaluation method that has the steps of repeatedly supplying to the liquid crystal panel, (i) a signal corresponding to an original tone, (ii) the test signal, and (iii) a signal corresponding to an attainment tone sequentially in this order while sweeping a level of the test signal, so as to analyze display results of the liquid crystal panel; and in accordance with analysis results, determining the optimum level of the test signal in association with the original tone and the attainment tone (Para 0090; "the tone data stored in the LUT are decided from the

result of Equation (4), taking into consideration such factors as response of the liquid crystal cell between tones (between tone construe the deference between the original tone and the attainment tone. The correction tone data refers to the test signal.), and a load capacitance of a pixel. Alternatively, the defined tone data may be decided by visually inspecting the actual response of tones on the liquid crystal panel." In order to attain the correction tones by visual inspection, the user must repeatedly inspect and analyze the original, and attainment tones by varying/sweeping the test signal to obtain the optimal value of the correction.).

Re claim 42, Miyata teaches a liquid crystal display device as set forth in claim 56, wherein:

the drive circuit stores as a Look-up Table an optimum level of either (i) an overshoot test signal (Para 0090; "The tone data stored in the form of the look-up table in the LUT memory." Para 0097; "The response can be improved with correction since in this case the influence of capacitance change of the liquid crystal cell can be suppressed." See Fig. 6, the overshoot voltage is applied as a correction to obtain correction tone within one frame.) or (ii) both an overshoot test signal and an undershoot test signal in accordance with tone transition from an original tone to an attainment tone; and

the optimum level is set to a level of the test signal that corresponds to an optimum one of display results, which is obtained by repeatedly supplying to the liquid crystal panel, a signal corresponding to the original tone and then, in accordance with

the tone transition, either (i) the overshoot test signal (Para 0090; "the tone data stored in the LUT are decided from the result of Equation (4), taking into consideration such factors as response of the liquid crystal cell between tones or (ii) both the overshoot test signal and the undershoot test signal while sweeping either a level of the signal (i) or levels of both the signals (ii), so as to analyze the display results of the liquid crystal panel (Para 0090; "the tone data stored in the LUT are decided from the result of Equation (4), taking into consideration such factors as response of the liquid crystal cell between tones (between tone construe the deference between the original tone and the attainment tone. The correction tone data refers to the test signal.), and a load capacitance of a pixel. Alternatively, the defined tone data may be decided by visually inspecting the actual response of tones on the liquid crystal panel." In order to attain the correction tones by visual inspection, the user must repeatedly inspect and analyze the original, and attainment tones by varying/sweeping the test signal to obtain the optimal value of the correction. The limitation regarding the undershoot will not be considered since the claim recites "either or" limitations.).

Re claim 43, Miyata teaches the liquid crystal display device as set forth in claim 42, wherein:

the drive circuit stores as a Look-up Table an optimum combination of a plurality of levels of the overshoot signal in predetermined tone transition (Para 0090; "The tone data stored in the form of the look-up table in the LUT memory." Para 0097; "The response can be improved with correction since in this case the influence of

capacitance change of the liquid crystal cell can be suppressed." See Fig. 6, the overshoot voltage is applied as a correction to obtain correction tone within one frame. Para 0098; "In a tone change like this whereby a response speed of the liquid crystal molecules becomes slow, it is preferable that the defined tone data in the look-up table of Fig. 9 take into consideration and add a value which reflects the slower response." Based on the response time, the combination of a plurality of levels of overshoot signal will be applied as seen in Figs. 6 - 8.); and

the optimum combination is set to a combination of levels of the overshoot test signal that corresponds to an optimum one of display results, which is obtained by repeatedly supplying to the liquid crystal panel, a signal corresponding to the original tone and then the overshoot test signal having a plurality of levels while sweeping the levels of the overshoot test signal, so as to analyze the display results of the liquid crystal panel (Para 0090; "the tone data stored in the LUT are decided from the result of Equation (4), taking into consideration such factors as response of the liquid crystal cell between tones (between tone construe the deference between the original tone and the attainment tone. The correction tone data refers to the test signal.), and a load capacitance of a pixel. Alternatively, the defined tone data may be decided by visually inspecting the actual response of tones on the liquid crystal panel." In order to attain the correction tones by visual inspection, the user must repeatedly inspect and analyze the original, and attainment tones by varying/sweeping the test signal to obtain the optimal value of the correction.).

Re claim 45, Miyata teaches the liquid crystal display device as set forth in claim 42, wherein: the optimum one of display results is a display result where the attainment tone is substantially displayed fastest without exceeding the attainment tone (See Fig. 6. The attainment is substantially displayed within one frame without exceeding the attainment tone.).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. **Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyata in view of Shimada et al. (Hereinafter "Shimada" US 5,801,673).**

Re claim 44, Miyata teaches the liquid crystal display device as set forth in claim 42, wherein: the drive circuit stores as a Look-up Table an optimum combination of a level of the overshoot signal in predetermined tone transition; and

the optimum combination is set to a combination levels of the overshoot test signal that corresponds to an optimum one of display results, which is obtained by repeatedly supplying to the liquid crystal panel, a signal corresponding to the original tone and the overshoot test signal sequentially in this order while sweeping the levels of the overshoot test signals, so as to analyze the display results of the liquid crystal panel (See the rejection of claim 42.)

But does not expressly describe an undershoot signal.

However, Shimada teaches a liquid crystal display device wherein an overshoot and an undershoot are added by the data signal generating circuit to portions of a waveform of a data signal (Shimada: Col. 13, lines 50 - 56.).

Therefore, taking the combined teachings of Miyata and Shimada, as a whole, it would have been obvious to a person having ordinary skill in the art to incorporate the idea of including an overshoot and an undershoot to the data signal waveforms as taught by Shimada into the liquid crystal display device as taught by Miyata to obtain a liquid crystal display device comprising a drive circuit that stores Look-up Table an optimum combination of a level of an undershoot and overshoot signals in predetermined tone transition to suppress the decrease in resolution and obtain a display with high quality (Shimada: Col. 13, lines 55 – 60).

9. **Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyata in view Usui et al. (Hereinafter "Usui" US 5,347,294).**

Re claim 46, Miyata teaches the liquid crystal display device as set forth in claim 42.

But does not expressly disclose wherein the Look-up Table is stored with respect to each of a plurality of temperatures.

However, Usui teaches an image display circuit comprising a table ROM with data of generated gray scale data greater (overshoot) than the gray scale of the current video signal (Usui: Col. 1, lines 45 – 60) and a plurality of ROM Tables provided in association with different temperature (Usui: Col. 6, lines 15 - 18.).

Therefore, taking the combined teachings of Miyata and Usui, as a whole, it would have been obvious to a person having ordinary skill in the art to incorporate the idea of having a plurality of ROM tables provided in association with different temperature as taught by Usui into the liquid crystal display device as taught by Miyata to obtain a liquid crystal display device comprising look-up tables comprising optimized overshoot signals wherein the plurality of look-up tables are provided in association with different temperatures to accomplish a high response speed and an image of high quality in conditions where temperature may vary.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YONG (MATT) SIM whose telephone number is (571)270-1189. The examiner can normally be reached on Monday - Friday (Alternate Fridays off) 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Yong Sim/
Examiner, Art Unit 2629

AMR A. AWAD
SUPERVISORY PATENT EXAMINER